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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/575,554

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Yoshiaki Hirose

YMUCP011

8941

22434

7590

11/24/2009

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EXAMINER

GREGORIO, GUINEVER S

ART UNIT

PAPER NUMBER

1793

NOTIFICATION DATE

DELIVERY MODE

11/24/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USPTO@wavsip.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/575,554	<b>Applicant(s)</b> HIROSE, YOSHIAKI	
	<b>Examiner</b> GUINEVER S. GREGORIO	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-19 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Shane et al. (U.S. Pat. No.

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3,404,061). Shane et al. teaches a flexible sheet material which consists essentially of graphite and is essentially free of any binding or bonding material and provides anisotropic or highly directional properties which corresponds to a graphite sheet with a thermal conductivity in a direction parallel to the surface (column 1, lines 14-20). Shane et al. teaches soaking natural graphite in bath comprising sulfuric acid and nitric acid (column 6, lines 37-45). Shane et al. further teaches a heat-treating stage after soaking the graphite (column 6, lines 45-51). Shane et al. teaches natural graphite and Kish (column 2, lines 64-66). Hence, Examiner takes the position that the thermal conductivity of the graphite sheet taught by Shane et al. would inherently or obviously possess the same properties as applicant's graphite sheet such as the thermal conductivity parallel to the surface because the method for making the graphite sheet and the materials for making the graphite sheet taught by Shane et al. is commensurate with applicant's method and materials for making a graphite sheet.

5. Regarding claims 2-4 and 18-19, Shane et al. teaches compressing and rolling the graphite sheet to a desired thickness (column 6, lines 50-70). Shane et al. teaches the graphite sheet has a high degree of flexibility, strength, anisotropy, and a very smooth surface with a metallic luster (column 6, lines 50-70). Shane et al. does not teach a method for calculating the surface roughness such as an arithmetic mean surface roughness equation, but Examiner takes the position the graphite sheet taught by Shane et al. would obviously or inherently have an arithmetic mean surface roughness less than 5 microns. As stated by applicant on page 6 of the specification, the value of the measured arithmetic mean of surface roughness is dependent of the

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smoothness of the graphite sheet. Hence, since Shane et al. teaches rolling the graphite sheet until smooth an lustrous Examiner takes the position that the graphite sheet taught by Shane et al. would inherently or obviously possess an arithmetic surface roughness less than 5 microns. Furthermore, the variations in thermal conductivity is dependent on smoothness and therefore since Shane et al. teaches a very smooth surface the graphite sheet taught by Shane et al. would obviously or inherently have a narrow range for thermal conductivity variations such as less than a 10% difference between the highest and lowest points. Furthermore, Examiner takes the position that the graphite sheet taught by Shane et al. is highly anisotropic because of the consistent thickness and smooth surface (column 6, lines 65-69).

6. Regarding claims 5-8, Shane et al. does not teach the wave shielding effect of the graphite sheet. However, Examiner takes the position that the graphite sheet taught by Shane et al. would inherently or obviously be capable of shielding electromagnetic waves at 60dB $\mu$ V/m or more in the frequency of 100-800 MHz because the graphite sheet taught by Shane et al. is made of material and is prepared by a method which is commensurate with applicant's graphite sheet.

7. Regarding claims 9-12, Shane et al. does not teach the impurity content of the graphite sheet, but Shane et al. teaches treating the graphite sheet with a halogen solution or gas which is commensurate with applicant's method for reducing contaminants on page 6, lines 29-31 (column 8, lines 34-55).

8. Regarding claims 13-16, Shane et al. teaches a range of 5-147 lbs/ft<sup>3</sup>, 0.80-8 Mg/m<sup>3</sup> which overlaps with a bulk density of 1.6 Mg/m<sup>3</sup> or more (column 4, lines 37-42).

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9. Regarding claim 17, Shane et al. teaches natural graphite and Kish (column 2, lines 64-66).

***Response to Arguments***

10. Applicant's arguments filed 07/13/2009 have been fully considered but they are not persuasive.

11. Applicant's arguments are directed toward specific limitations which the prior art of record does not teach. Examiner acknowledges Shane et al. does not teach a thermal conductivity of 350 W/(mK) or an arithmetic mean surface roughness of less than 5 microns or that the lowest values of local thermal conductivities at various spots on the expanded-graphite sheet is 10% or less of the overall mean thermal conductivity thereof. However, the issue is whether the method of making taught by Shane et al. would produce an expanded graphite that possesses the desired properties claimed by applicant. As stated in the previous Office Action and *supra* the materials and method of making are commensurate with the materials and method taught by applicant. Therefore since the materials and method of making are commensurate the product produced by the method taught by Shane et al. would either inherently or obviously meet the limitations claimed by applicant. Examiner would appreciate evidence such as experimental data which proves the method taught by Shane et al. would not produce expanded-graphite with the desired properties claimed by applicant.

12. Applicant then argues the method taught by Shane et al. would produce a graphite sheet with microscopic wrinkles and defects. Examiner takes the position that any graphite sheet observed under high magnifications would exhibit microscopic

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wrinkles and defects. Hence Examiner is not persuaded by applicant's argument that microscopic wrinkles would adversely affect the physical properties of an expanded graphite sheet.

### ***Conclusion***

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GUINEVER S. GREGORIO whose telephone number is (571)270-5827. The examiner can normally be reached on Monday-Thursday, 10:30-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curt Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Gsg

November 17, 2009

/Melvin Curtis Mayes/  
Supervisory Patent Examiner, Art Unit 1793